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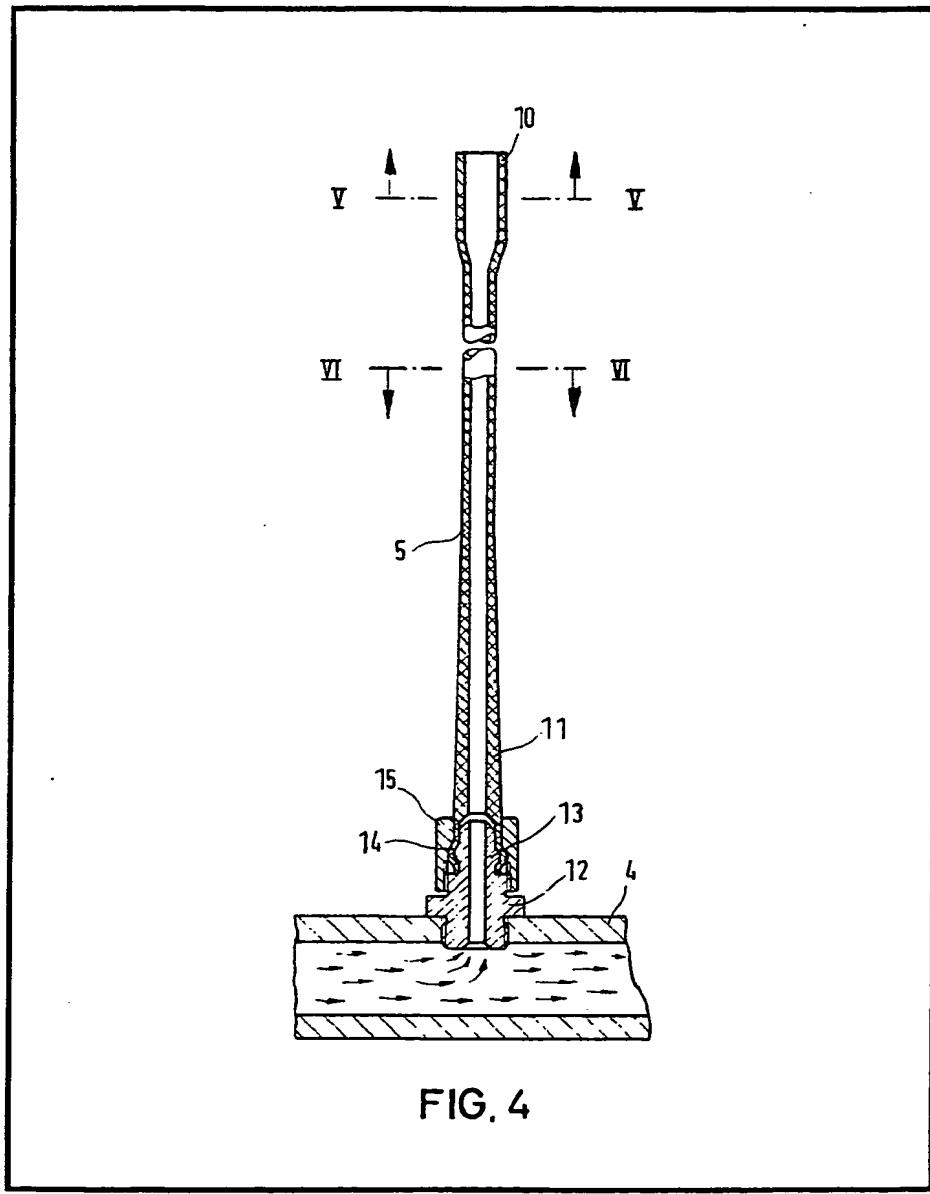
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(54) A device for washing and possibly otherwise treating the underside of a vehicle

(57) A device for washing the underside of vehicles, in which a plurality of tubular nozzles (5) of an elastically flexible material are mounted on a container (4) in communication with a pressure source, and the said tubular nozzles are flattened at their outset side and are elastically

deflected when they come into contact with vehicle parts and thereby spray cleaning liquid from various directions onto the vehicle underside.



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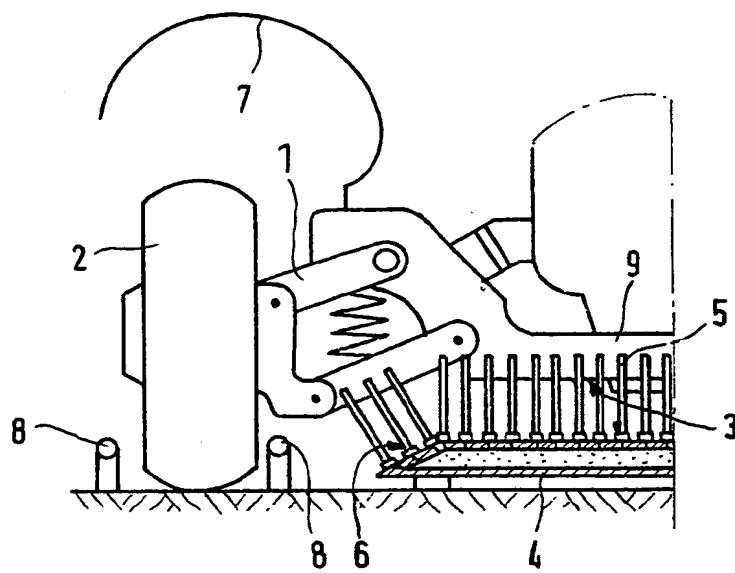


FIG. 1

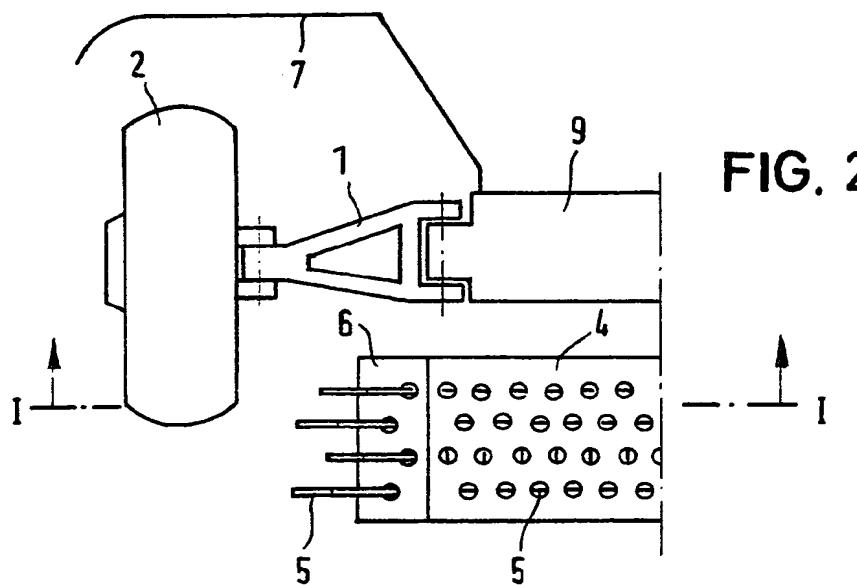


FIG. 2

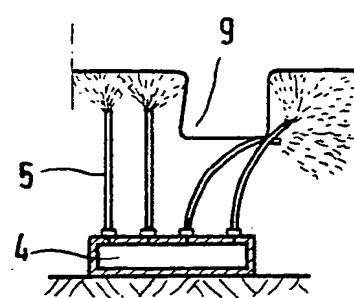


FIG. 3

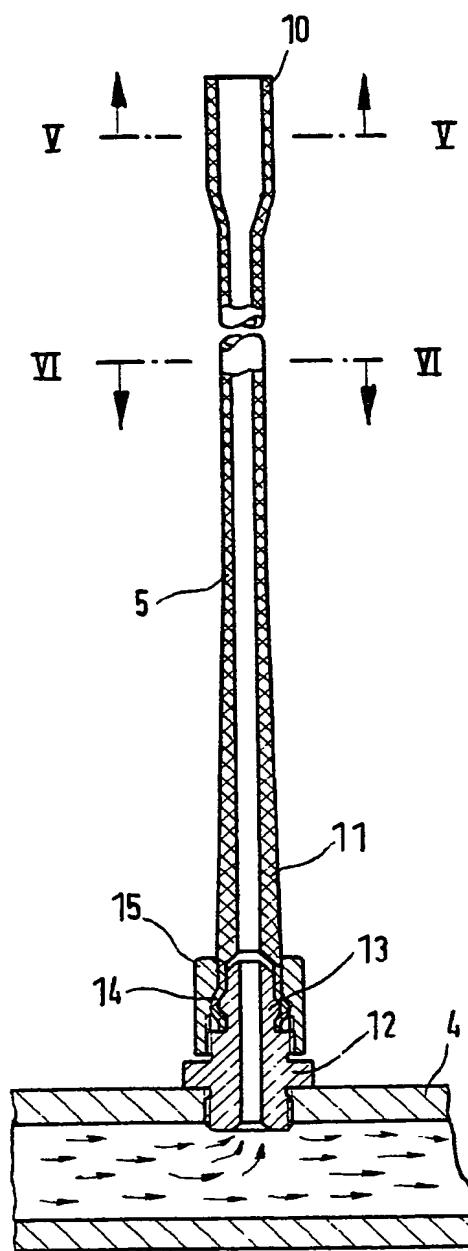


FIG. 4

FIG. 5

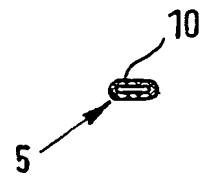
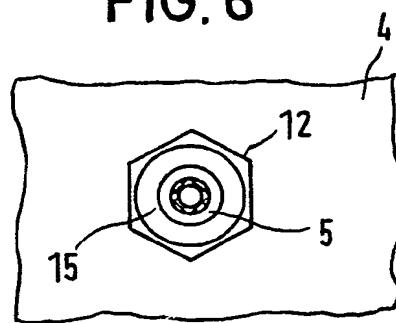


FIG. 6



## SPECIFICATION

## A device for washing and possibly otherwise treating underside of a vehicle

5 TECHNICAL FIELD OF THE INVENTION  
The invention relates to a device for washing and possibly otherwise treating the underside of a vehicle, said device consisting of a plurality of nozzles movable relative to the vehicle, which are in communication with a reservoir containing the treatment medium as well as a pressure source.

## 15 BACKGROUND ART

In both stationary vehicle wash bays and movable gantry-type vehicle wash units it is known to wash the underside of the vehicle by spraying water under high pressure  
20 through nozzles against the underside surface. Other agents, for example anti-corrosion agents, drying air, and the like, can also be sprayed in the same way. The nozzles may be arranged stationary (US Patent Specification 3  
25 545 459) or movable (German Offenlegungsschrift 2 634 551, German Patent Specification 1 239 203, and US Patent Specification 3 908 907).

In these known arrangements there is the  
30 problem that the vehicle may not be completely cleaned during the wash procedure, which is evidently connected with the fact that the nozzle outlet openings are at too great a distance from the vehicle underside. As a rule  
35 the nozzles consist of metal parts which, particularly in winter, are subject to considerable corrosion on account of salt washed off from the surfaces being cleaned.

The object of the invention is thus to develop a device for washing or otherwise treating the underside of a vehicle which is corrosion-resistant and provides for a substantially better removal of dirt from the surfaces to be cleaned.

45 Starting from the basis of the known arrangement mentioned at the beginning, the essence of the invention is that each individual nozzle consists of a vertically arranged tube of an elastically flexible material,  
50 in particular plastics material, joined by a screw connection to a container.

Such an arrangement can be realised in both stationary and movable embodiments. The essential feature is simply that there exists a relative movement between the vehicle being washed or treated, and the device according to the invention.

As a result of the nozzles being in the form of elastically flexible tubes, it is possible to bring the nozzle outlet opening as close as possible to the surface being treated without causing any damage. Accordingly, the whole flow energy is utilised in washing off the dirt on the underside of the vehicle. In this connection, a favourable flow direction at the

nozzle outlet is obtained as a result of the flexibility of the tubes. The medium ejected under pressure does not strike the surface being treated vertically, but at an acute angle,

70 and in this way a high cleaning efficiency is produced with a low expenditure of energy. In the scope of one embodiment it is recommended to form the tube flattened on the outlet side. In this way a fanlike, broad jet is  
75 produced which likewise contributes to a better removal of dirt.

In another embodiment of the invention the tube on the connection side has a conical wall thickening, the internal cross-section remaining constant. Moreover, it is recommended to provide a threaded connecting pin with an external circumferential collar and the tube with a corresponding flared portion, which can be tensioned against one another by means of  
80 a sleeve nut. This design of the tube means that the latter can sufficiently withstand the many bending stresses that arise, since it is envisaged that the bent tube will return under its own force to its original position once the  
85 vehicle being treated has passed through the device according to the invention. The fact that the tubes are connected to the container enables the individual tubes to be replaced quickly and easily if another method of treatment is desired or if replacement appears necessary on account of wear and tear.

The length of the individual tubes is advantageously greater than the average distance between the underside of the vehicle and the  
100 ground. The tubes are thus bent by the vehicle itself.

In another embodiment of the invention the container is in the form of a roughly rectangular-shaped box of low height, e.g. 60 mm, on which a plurality of tubes are mounted in rows. In this connection it is recommended to design the container upper wall so that it slopes outwardly downwards at both ends, and to arrange the tubes connected to the  
105 container approximately vertically to the inclined surface. With such an arrangement it is possible to treat the wheels and wheel housings as well as the inner surfaces of mud guards and wings with upwardly and outwardly directed jets, a more efficient washing effect thereby being obtained.

## BRIEF DESCRIPTION OF THE DRAWINGS.

Details of the invention are illustrated by  
120 way of example and diagrammatically in the drawings, in which:

Figure 1 is a partial front view of a vehicle running gear, together with part of the device according to the invention,

125 Figure 2 is a partial plan view of the arrangement according to Fig. 1,

Figure 3 is a partial side view of the arrangement according to Figs. 1 and 2,

Figure 4 is a longitudinal section through a  
130 nozzle in the form of a tube,

Figure 5 is a section through the tube along the line V-V in Fig. 4, and

Figure 6 is a cross-section through the tube along the line VI-VI in Fig. 4.

5 One half of a running device 1 of a vehicle is illustrated in front view in the embodiment of Fig. 1. The running gear 1 carries a wheel 2 enclosed by a wheel housing 7. The running gear 1 is articulatedly connected to a  
 10 chassis member 9 whose underside 3 is to be washed or otherwise treated with the aid of a device 4, 5. In the embodiment the wheel 2 is guided between the guide rails 8, as is usual in both stationary and movable vehicle  
 15 wash units.

The device according to the invention consists of a container 4 in which the treatment medium is accommodated and can be subjected to pressure. This container 4 is approximately rectangular in the embodiment illustrated. It has been found advantageous to select a steel or cast iron construction for this purpose having a hollow internal volume approximately 60 mm high, 400 mm wide and  
 20 approx. 1200 mm long. These dimensions should of course be understood as being only by way of example.

A plurality of nozzles 5, fabricated in the form of tubes from an elastically flexible  
 30 material, for example rubber or plastics material, are arranged on the upwardly directed side of the container 4. The length of these tubes 5 is dimensioned, in the embodiment of Fig. 1, so that the underside 9, 3 of  
 35 the vehicle is in contact with the said tubes. Since the tubes 5 are flexible, they will bend if there is any relative movement between the vehicle and tubes. If the medium in the container 4 is under pressure, the said medium  
 40 will flow in a powerful stream through the tubes 5, the direction of the flow varying corresponding to the degree of bending. In this way it is possible intensively to clean very dirty substructure units of vehicles, including  
 45 the running gear and other vehicle parts. In the same way, preservation agents may also be applied or drying operations using air or steam may also be carried out.

In the embodiment of Figs. 1 and 2, the  
 50 end regions of the container 4 slope outwardly downwards. The tube 5 mounted on the inclined surfaces 6 are aligned approximately vertically to these surfaces and are therefore adapted intensively to clean or otherwise treat the insides of the wheels, the  
 55 running gear 1, as well as the wheel housing 7.

From Fig. 3 it can be seen that constantly changing flow directions are produced as a  
 60 result of the varying degrees of bending of the individual tubes 5; a chassis member 9 projects beyond the underside surface of the vehicle, and is illustrated diagrammatically. It can be seen that even difficultly accessible  
 65 corners can be intensively cleaned in this way.

An individual tube 5 is illustrated in longitudinal section in the embodiment of Fig. 4. It can be seen that the tube—also as shown in Fig. 5—has a flattened region 10 at the

70 outlet opening, whereby the exiting jet assumes a relatively broad, fan-like contour. The wall thickness of the tube 5 increases conically in the direction of the container 4, though the internal cross-section remains the same. This shape imparts a high degree of elasticity to the tube 5, this elasticity being able to restore the tube 5 to its original position when it is deflected by the vehicle.  
 75 A plurality of threaded connecting pins 12 are located on the container 4, and have a circumferential collar 13 on the outside which is surrounded by a corresponding internal flared portion 14 of the tube 11. The internal flared portion 14 need only be tensioned  
 80 against the collar 13 by means of a sleeve nut 15 in order to produce a secure connection between the tube 5 and container 4. Such an arrangement enables a tube 5 of varying shape to be secured to the container 4 and  
 85 easily removed therefrom and replaced. It is thus for example possible for a tube 5 used to wash a vehicle to have a different shape from a tube 5 used to apply preservation agents or for the passage of drying air.  
 90 95 The invention is thus not restricted to the embodiments illustrated herein but also covers all variants that suggest themselves within the scope of the disclosures according to the invention to those skilled in the art.

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#### CLAIMS

1. A device for washing and/or otherwise treating the underside of a vehicle, said device comprising a plurality of nozzles moveable relative to the vehicle, and in communication with a reservoir containing the treatment medium as well as a pressure source, characterised in that the individual nozzles consist of a substantially vertically arranged tube (5) of an elastically flexible material joined by a screw connection (12, 15) to a container (4).
2. A device as claimed in Claim 1, characterised in that a tube (5) is of flattened cross-section (10) at its outlet end.
3. A device as claimed in Claim 1 or Claim 2, characterised in that a tube (5) has a conical wall thickening (11), at its connection end, the internal cross-section of the tube remaining constant.
4. A device as claimed in any one of the preceding claims, characterised in that a threaded connecting port (12) on the container has a circumferential collar (13) on the outside, and the tube (5) has a corresponding internal flared portion (14), which can be tensioned against the collar by means of a sleeve nut (15).
5. A device as claimed in any one of the preceding claims, characterised in that the length of the individual tubes (5) is greater

than the average distance between the vehicle undersurface (3) and the ground.

6. A device as claimed in any one of the preceding claims, characterised in that the 5 container (4) is formed as an approximately rectangular-shaped box of low height, e.g. 60 mm, on which a plurality of tubes (5) are mounted in rows.

7. A device as claimed in any one of the 10 preceding claims, characterised in that an upper wall of the container (4) slopes outwardly downwards (6) at least one end, and the tubes (5) secured thereon are arranged substantially normal to the inclined surface 15 (6).

8. A device as claimed in any one of the preceding claims, characterised in that an upper wall of the container (4) slopes outwardly downwards (6) at two opposite ends, 20 and the tubes (5) secured thereon are arranged substantially normal to the inclined surfaces (6).

9. A device as claimed in any one of the preceding claims, characterised in that the 25 tubes (5) are formed from plastics material.

10. A device for washing and/or otherwise treating the underside of a vehicle substantially as hereinbefore described with reference to the accompanying drawings.

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